Amendments to the Drawings:

The drawings have been changed as follows:

Fig. 1 has been objected to as including term that does not make grammatical sense. Applicant has amended Fig. 1 to overcome the objection. Specifically:

The wording "radio transmition" appeared in Fig. 1 is modified into "radio transmission".

Applicant has amended Fig. 1 in accordance with the pg.3, pp2 of specification of the application. Specifically:

The wording "base station 1" which is located on the first antenna of the base station 1 appeared in Fig. 1 is modified into "antenna 1".

The wording "base station N" which is located on the last antenna of the base station 1 appeared in Fig. 1 is modified into "antenna N".

The wording "base station 1" which is located on the first antenna of the base station N appeared in Fig. 1 is modified into "antenna 1".

The wording "base station N" which is located on the last antenna of the base station N appeared in Fig. 1 is modified into "antenna N".

In order to make Figs. 1-3, 5 more clearly, applicant has amended Figs.1-3, 5. Specifically:

The shaded region of Fig. 1 is eliminated.

Figs. 2, 3 are redrawn without changing the original text of Figs. 2, 3.

In Fig. 5, the black fill pattern indicating statistic frequency number (Nmax=3) is modified into diagonal fill pattern.

The shaded region of Fig.5 is eliminated.

For the above mentioned amendments, the replacement sheets 1, 2, 4 of Drawings are attached with this paper.

REMARKS

Claims 1-14 are pending and all stand rejected. Applicant has amended claims 1-14 and respectfully submits that claims 1-14 are allowable as amended.

Claim Objections

Claim 1 has been objected to as including term that does not make grammatical sense. Applicant has amended claim 1 to overcome the objection. Specifically:

The wording "comprise the" appeared in line 2 of claim 1 is modified into "comprising".

Claim 3 has been objected to as including term that does not make grammatical sense. Applicant has amended claim 3 to overcome the objection. Specifically:

The wording "results" appeared in line 4 of claim 3 is modified into "resulting".

Claim 9 has been objected to as including term that does not make grammatical sense. Applicant has amended claim 9 to overcome the objection. Specifically:

The wording "weighting combining" appeared in line 3 of claim 9 is modified into "weighted combining".

Claim 13 has been objected to as including term that does not make grammatical sense. Applicant has amended claim 13 to overcome the objection. Specifically:

The wording "comprise the" appeared in line 2 of claim 13 is modified into "comprising";

The wording "combinting" appeared in line 7 of claim 13 is modified into "combining".

Claim Rejections - 35 U.S.C.§112

Claim 1 has been rejected to as including term that lack antecedent basis. Applicant has amended claim 1 to overcome the rejection. Specifically:

The wording "each station" appeared in line 5 of claim 1 is modified into "each base station".

Claim 2 has been rejected to as including term that lack antecedent basis. Applicant has amended claim 2 to overcome the rejection. Specifically:

The wording "predefined number of base stations" appeared in line 5 of claim 2 is modified into "predefined maximum number of base stations";

The wording "predefined number of signals" appeared in line 6 of claim 2 is modified into "the signals determined in step A1 by the predefined maximum number of base stations";

The wording "the given threshold" appeared in line 8 of claim 2 is modified into "a given threshold".

Claim 8 has been rejected to as including term that lack antecedent basis. Applicant has amended claim 8 to overcome the rejection. Specifically:

The wording "predetermined value added length" appeared in line 5 of claim 8 is modified into "a predefined value added length".

With the amendment, Applicant respectfully submits that the § 112 rejections have been overcome and requests the withdrawal of the same.

Claim Rejections - 35 U.S.C.§103

Claims 1-5, 7, 9, 13-14 have been rejected under 35 U.S.C.§103(a) as being unpatentable over *Frigon* (U.S. Publication No.2003/0108135) in view of *Chen* et al. (U.S. Patent No.7,269,206).

Claim 6 are rejected under 35 U.S.C.§103(a) as being unpatentable over *Frigon* (U.S. Publication No.2003/0108135) in view of *Chen* et al. (U.S. Patent No.7,269,206) as applied to claim 1 above, and further in view of *Li* et al. (U.S. Patent No.6,778,588) in view of *Demir* et al. (U.S. Publication No.2003/0072357).

Claim 8 are rejected under 35 U.S.C.§103(a) as being unpatentable over *Frigon* (U.S. Publication No.2003/0108135) in view of *Chen* et al. (U.S. Patent No.7,269,206) as applied to claim 2 above, and further in view of *Li* et al. (U.S. Patent No.6,778,588) in view of *Lucidarme* et al. (U.S. Publication No.2004/0196793).

Claim 10-12 are rejected under 35 U.S.C.§103(a) as being unpatentable over *Frigon* (U.S. Publication No.2003/0108135) in view of *Chen* et al. (U.S. Patent No.7,269,206) as applied to claim 9 above, and further in view of *Ono* (U.S. Patent No.6,996,156).

Applicant respectfully submits that the claims 1-14 are allowable as amended.

As amended, claim 1 recites a method for estimating carrier frequency offset in subscriber terminals in TD-SCDMA system, the method comprising:

A. determining number of effective base stations with same carrier frequency from which more than one signals are received by a subscriber terminal and main path positions of each signal;

B. combining the signals of each base station with same carrier frequency corresponding to the number of effective base stations with same carrier frequency based on the main path positions obtained in step A;

C. calculating a rough estimation value of the carrier frequency offset based on combined signal in step B.

US Publication No.20030108135 (Hereinafter referred as *Frigon*) discloses a method for synchronization in wireless systems using receive diversity. The method comprises the following aspects:

- The weighted/non-weighted output magnitudes 105, 123 determined in step 1 are combined 125 thereby forming a weighted/non-weighted non-coherent combining diversity output value 127. (pg.6, pp0090)
- The weighted/non-weighted non-coherent combining diversity output value 105, 123 is compared 111 against a predetermined threshold 113. If this diversity output value 105, 123 exceeds the predetermined threshold value 113, code synchronization is accomplished 115. If this diversity output value 105, 123 does not exceed the predetermined threshold 113, code detection continues 117. (pg.6, pp0091)
- Instead of a threshold comparison method, including maximum selection, multi-dwell, or multi-stage code acquisition may also be employed to determine whether code determination has been achieved. (pg.6, pp0092)
- In the method employing a weighted coherent combining diversity receiver, a preferred first step comprises: 1) computing, for each of the M diversity branches, an estimate of the relative power of the diversity branch relative to the other branches 193, and 2) weighting each of the M diversity branches of the DD output by the relative power of each diversity branch relative to the others 195. (pg.8, pp0136)

- The combined DD output is input to the averaging block, and average over multiple DD outputs. In a preferred fourth step 171, the average DD value is used to compute the frequency estimate. (pg.8, pp0137, Figs. 17-18)

It can thus be readily seen that claim 1 differs from the disclosure of *Frigon* as follows:

First, step A of claim 1 discloses that a normal subscriber terminal receives more than one signal from number of effective base stations with same carrier frequency. In contrast, *Frigon* discloses that a mobile terminal comprising M diversity branches receives signals from only one base station.

Second, step B of claim 1 discloses that the normal subscriber terminal combines the signals of each base station with same carrier frequency corresponding to said number of effective base stations with same carrier frequency based on the main path positions. In contrast, *Frigon* discloses that the diversity mobile terminal combining signals which are from only one base station and transmitted in M diversity branches.

Third, the combined signal for estimating the value of the carrier frequency offset in claim 1 is different from the combined signal in *Frigon*. For a normal subscriber terminal, combining signals from different base stations in claim 1 needs more information than combining signals transmitted in M diversity branches from only one base station in *Frigon*.

Therefore, Frigon at least fails to disclose or suggest the above-quoted limitations of claim 1.

Furthermore, *Frigon* teaches away from the invention of claim 1: *Frigon* discloses a solution for synchronizing a mobile terminal comprising M diversity branches to a wireless network using diversity combination to acquire the code transmitted from a base station and to determine the frequency offset of the transmitted code. In contrast, the invention of claim 1 provides a method and a device for estimating carrier frequency offset in a subscriber terminal to make the carrier frequency offset in a subscriber terminal to meet the system requirements and thus improve the probability of success for the initial search for a cell. See, for example, p. 3, line 27 to p. 4, line 4 of the specification. Thus, *Frigon* seeks to address a different technical problem than, and teaches away from, the invention of claim 1. Thus, claim 1 is not obvious in light of *Frigon*.

U.S. Patent No.7,269,206 (Hereinafter referred as *Chen* et al) discloses flexible correlation for cell searching in CDMA system, comprising the following aspects:

- The UE 100 includes a transceiver 101 and a stage 1 110 that are equivalent to the prior art UE 30, as well as a secondary correlation unit 120 that generates secondary correlation results 121t that may be regarded as a table of correlation results corresponding to code group and slot number information. The UE 100 also includes a primary correlation unit 131 that is similar to that of the UE 30, but rather then providing a primary correlation result 131c over a frame 12 of slots 14, the primary correlation unit 131 performs the primary scrambling code correlation procedure over a number of frames 132x determined by a primary control unit 132. (Col.5, lines 9-20)

- FIG. 9 is a flow chart for the secondary selection unit 122. Initially, the secondary selection unit 122 references into the secondary correlation table 121t and selects the greatest n 122n values. It has been determined that, 93% of the time, the greatest value in the secondary correlation table 121t will provide the correct synchronization result 135. However, 5% of the time it is the second-greatest value in the secondary correlation table 121t that provides the synchronization result 135. In the preferred embodiment, n is three, as this statistically covers better than 98% of the potential synchronization values, while being sufficiently small to provide the primary correlation unit 131 with enough slots 14 to obtain a reasonably accurate correlation result 131c. The selection unit 122 orders the n 122n greatest secondary correlation values from the secondary correlation table 121t from greatest to least. The n 122n secondary correlation values are then normalized by dividing them all by the greatest secondary correlation value. (Col.5, lines 30-44)

- The greatest value, C_{15}, is passed on immediately as a candidate 123a. All other values are sequentially checked in descending order against a preset threshold 122t. If any normalized value does not meet the threshold value 122t, it and all subsequent normalized values are discarded as candidates. Consequently, the secondary selection unit 122 provides m candidates 123a-123m, where m is at least 1, and which is less than or equal to n 122n. (Col.5, lines 50-58)

It is thus readily evident that claim 1 is distinguishable from *Chen et al* in at least the following ways:

Claim 1 relates to a method and device for estimating carrier frequency offset in subscriber terminals in TD-SCDMA system. It focuses on estimating carrier frequency offset when

performing initial cell search in TD-SCDMA system. In contrast, *Chen et al* relates to the flexible use of correlators when selecting the primary scrambling code from a multiple of scrambling code groups is disclosed in WCDMA system. It focuses on scrambling code identification when performing initial cell search in WCDMA system.

Therefore, Chen et al at least fails to disclose or suggest the above-quoted limitations.

Furthermore, Chen et al teaches away from the invention of claim 1. *Chen et al* seeks to provide a cell search method, and related device, that make flexible use of correlators to select a primary scrambling code across a multiple of code group candidates using only a frame's worth of slots. In contrast, the invention of claim 1 provides a method and a device for estimating carrier frequency offset in a subscriber terminal to make the carrier frequency offset in a subscriber terminal to meet the system requirements and thus improve the probability of success for the initiate search for a cell. See, e.g., p. 3, line 27 to p. 4, line 4 of the specification. Thus, Chen et al seeks to solve a different technical problem than, and teaches away from, invention of claim 1 of the present application.

In addition, the invention of claim 1 of the present application has at least the following advantages over the prior art: The method for estimating carrier frequency offset provided by the invention is especially suitable to a condition that the strengths and SIR of SYNC_DL signals received by a mobile user from several base stations are approximate among them, i.e., a mobile user is located at the joint edge of several cells, and with the method for carrier frequency offset estimation provided by the invention, the probability of success for the initiate search for a cell can be improved greatly. Even when the SYNC_DL signal received by a mobile user from one base station is much stronger and those received from other base stations are not so strong, the accuracy of adjustment for carrier frequency offset also can be improved by using the method for estimating carrier frequency offset provided by the invention. With respect to a method utilizing the SYNC_DL signals from one base station, the closer of the SYNC_DL signal strength and SIR from several base stations, the more improvement the accuracy of carrier frequency offset adjustment. (See, e.g., p.5, lines 13-26.)

The above mentioned technical effects would not be obtained by *Frigon* and *Chen et al.* Therefore, claim 1, as well as dependent claims 5, 7 and 9, are not obvious over *Frigon* in view of *Chen et al.* The applicant respectfully requests the withdrawal of the rejection of claims 1-5, 7 and 9 under 35 U.S.C. § 103 over *Frigon* and *Chen.*

Independent apparatus claim 13 includes limitations that correspond to those in claim 1. Thus for at least the same reasons stated above regarding claim 1, claims 13, as well as its dependent claim 14, are patentable over *Frigon* and *Chen et al.* The applicant respectfully requests the withdrawal of the rejection of claims 13-14 under 35 U.S.C. § 103 over *Frigon* and *Chen.*

Regarding claim 6, which depends on claim 1, the additionally cited *Li* and *Demir* also fail to disclose or suggest the above-quoted limitations in claim 1. Thus, claim 1 is patentable over the reference cited against claim 6. Claim 6 is thus patentable for at least the same reasons that claim 1 is patentable. The applicant respectfully requests the withdrawal of the rejection of claim 6 under 35 U.S.C. § 103 over *Frigon, Chen, Li* and *Demir.*

Regarding claim 8, which is dependent on claim 1, the additionally cited *Li* and *Lucidarme* also fail to disclose or suggest the above-quoted limitations in claim 1. Thus, claim 1 is patentable over the reference cited against claim 8. Claim 8 is thus patentable for at least the same reasons that claim 1 is patentable. The applicant respectfully requests the withdrawal of the rejection of claim 8 under 35 U.S.C. § 103 over *Frigon, Chen, Li* and *Lucidarme.*

Regarding claims 10-12, which are dependent on claim 1, the additionally cited *Ono* also fails to disclose or suggest the above-quoted limitations in claim 1. Thus, claim 1 is patentable over the reference cited against claims 10-12. Claims 10-12 are thus patentable for at least the same reasons that claim 1 is patentable. The applicant respectfully requests the withdrawal of the rejection of claims 10-12 under 35 U.S.C. § 103 over *Frigon, Chen* and *Ono.*

SUMMARY

In view of the above amendments and remarks, Applicant respectfully requests a Notice of Allowance. If the Examiner believes a telephone conference would advance the prosecution of this application, the Examiner is invited to telephone the undersigned at the below-listed telephone number.

Respectfully submitted,

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